Appendix C
Overview of Policies and Procedures

Appendix C – Overview of Policies, Habitat Conservation Plan Strategies, and DNR Forestry Handbook Procedures that Apply to Resources Addressed in this Environmental Impact Statement

Appendix C

C.1. THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES

The federal Endangered Species Act was passed in 1973 to "conserve the ecosystems on which endangered and threatened species depend" and to conserve and recover the listed species. Species may be listed federally as either "endangered" or "threatened." Endangered means the species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. Species can also be designated as a species of concern, an unofficial status indicating that the species may be in jeopardy.

The "take" provisions of the Endangered Species Act limit conduct that could harm, wound, kill, or collect listed plant species. The "take" provisions do not apply to listed plant species on state lands, unless the land is part of a project that involves either federal funding or requires a permit issued by a federal agency.

Washington does not have a state endangered species act. However, the Washington Natural Heritage Program, part of Washington DNR, was created in 1981 to collect data about existing native ecosystems and plant species and to provide an objective, scientific basis from which to determine protection needs. The Program classifies rare plants within the state as endangered, threatened, or sensitive and maintains a database of known occurrences. The Program does not have regulatory authority but encourages land managers to conserve rare plants in their natural condition. Transplanting or reintroduction of rare plants has met uncertain success and is not a preferred method of recovery or mitigation.

The Washington State Forest Practices Rules do not include specific regulations regarding threatened, endangered, and sensitive plants. However, the State Environmental Policy Act process must be followed for timber harvest activities. The State Environmental Policy Act provides a way to identify possible effects to environmental assets including rare plants. The review process includes disclosure of any known occurrences of listed threatened and endangered plants. Although there are no required actions, this information could be used to reduce likely impacts.

DNR management activities on all forested trust lands follow DNR Forest Resource Plan Policy No. 23, Endangered, Threatened, and Sensitive Species. It states that,

> "The Department will meet the requirements of federal and state laws and other legal requirements that protect endangered, threatened and sensitive species and their habitats. In addition, the Department will voluntarily participate in efforts to recover and restore endangered and threatened species to the extent that such participation is consistent with trust obligations."

C.2. RIPARIAN AREAS

The DNR Forest Resource Plan policy relevant to riparian areas is Policy No. 20, Riparian Management Zones. This policy requires the establishment of Riparian Management Zones along Types 1 through 4 waters and where necessary along Type 5 streams. Within these Zones, DNR is required to focus its efforts on protecting non-timber resources such

as water quality, fish, wildlife habitat, and sensitive plant species. This policy is realized today through the implementation of DNR's Habitat Conservation Plan.

Under the Habitat Conservation Plan (DNR 1997), riparian zones are protected through the Riparian Conservation Strategy and the implementation of Riparian Management Zones along each side of a stream. The width of a Riparian Management Zone along Types 1 through 3 streams within the westside planning units –excluding the Olympic Experimental State Forest– is equal to the average height of an adjoining conifer stand at a 100-year site index or 100 feet, whichever is greater. For Type 4 streams, Zones are 100 feet wide. Riparian Management Zones start at the outer edge of the 100-year floodplain. In addition, 50-foot (for Type 3 streams greater than 5 feet wide) or 100-foot (for Types 1 and 2 streams) "windthrow buffers" are required on the windward side of streams that have at least a moderate risk of blowdown. Under the Habitat Conservation Plan, the first 25 feet of a Riparian Management Zone is a no-harvest zone where only ecosystem restoration activities are permissible. The next 75 feet is a minimal-harvest zone where ecosystem restoration and single-tree selection permitted. The remaining portion of the Riparian Management Zone is a low-harvest zone where ecosystem restoration, single-tree selection, group selection, thinning, and salvage harvest are permitted. Yarding corridors, and road-stream crossings are allowed throughout a Riparian Management Zone. See the Habitat Conservation Plan (DNR 1997, pages IV.49 to IV.62) for additional details.

The riparian conservation strategy for the Olympic Experimental State Forest is different from the other five westside planning units, because of the unique physical and ecological features of the western Olympic Peninsula. These differences are primarily related to the high potential for mass wasting and windthrow (DNR 1997, page IV.106). Within the Olympic Experimental State Forest, streams receive protection through interior-core buffers and exterior buffers. Prescriptions are more flexible than the other five westside planning units in order to be consistent with the experimental nature of management in the Olympic Experimental State Forest. Interior-core buffer widths are developed on a site-specific basis and vary depending upon channel size, valley confinement, and landform characteristics. Exterior buffers are designed to protect the integrity of interior-core buffers from damaging winds and maintain riparian functions. Widths average 150 feet for Types 1, 2, and 3 streams, and 50 feet for Types 4 and 5 streams.

Procedures 14-004-150 (five westside planning units, excluding the Olympic Experimental State Forest) and 14-004-160 (Olympic Experimental State Forest) for Identifying and Protecting Riparian and Wetland Management Zones have been developed to implement the Forest Resource Plan policy and Habitat Conservation Plan conservation strategy. Currently, the riparian conservation strategy for the Habitat Conservation Plan has not been completely implemented. Procedure 14-004-150 is interim until the permanent procedure is developed and approved by the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration – Fisheries Service. Under the current interim procedure, timber harvest is not allowed within Riparian Management Zones except for road and bridge building. Other forest management activities are permissible with specific approval by the State Lands Assistant in each DNR Region.

Riparian forest management activities that could be implemented in riparian areas of the six westside planning units include road building and stream crossings, yarding corridors, restoration, invasive and competing plant control, fertilization and varying levels of timber harvest (minimal and low). Development of permanent roads removes trees along the road corridor, disturbs stream banks, and may provide a pathway for the transport of water and sediment from the roadway to a stream. Yarding corridors also remove trees, but may contribute to soil disturbance or compaction along yarding corridors if full suspension of the logs is not achieved. Yarding corridors are generally used when cross-stream yarding is more economical and less damaging to the environment than building a road.

The Habitat Conservation Plan allows forest management activities that maintain or restore the quality of salmonid habitat within the Riparian Management Zone, including timber harvest in some sub-zones of Riparian Management Zones (DNR 1997, pp IV.59 and IV.60). Within five of the six westside planning units (i.e., excluding the Olympic Experimental State Forest), "silvicultural practices that might be appropriate for Riparian Management Zones may include precommercial thinning, commercial thinning, partial cuts, single tree selection harvesting, and stand conversion" (DNR 1997, p. IV.208). Consequently, regeneration harvests are not allowed within Riparian Management Zones under the Habitat Conservation Plan (but were conducted prior to this plan under the Forest Practices rules in place at the time of harvest). Restoration activities can include conversion of hardwood-dominated stands to conifer and pre-commercial or commercial thinning to accelerate the growth of riparian trees (DNR 1997, p. IV.208). Thinning reduces stocking levels and competition while increasing growth rates for remaining trees (Carey et al. 1996, Thysell and Carey 2000).

The Habitat Conservation Plan strategies envisioned partial cuts and single tree harvest in Riparian Management Zones to increase wind-firmness and develop older forest conditions or for other reasons (DNR 1997, pp IV.60, IV.209). In the no-harvest zone, only road construction, yarding corridors, and restoration activities are permitted. In the minimal-harvest zone, single tree selection is permitted in addition to roads, yarding, corridors, and restoration activities. The remaining sub-zone of the Riparian Management Zone (low-harvest zone) and any associated wind buffer may include the activities of the other sub-zones plus partial harvests.

Within the Olympic Experimental State Forest, there are no programmatic restrictions on harvest activities within the interior-core and external riparian buffer zones. However, a 12-step process (DNR Procedure 14-004-160) is followed for conducting environmental assessments, designing buffer widths, and developing silvicultural and road development prescriptions plus monitoring, documentation, and review requirements.

C.3. WILDLIFE SPECIES AND HABITATS

This section describes the policies and procedures that govern DNR's management of wildlife resources on westside trust lands, as well as those that indirectly influence wildlife species by directing DNR's management of the habitats upon which wildlife depend.

Forest management activities on DNR-managed lands are governed principally by the policies in the Forest Resource Plan. The Habitat Conservation Plan provides strategies to

achieve specific conservation objectives for identified species and habitats within the range of the northern spotted owl. These and other strategies are implemented by procedures in the Forestry Handbook. Collectively, policies in the Forest Resource Plan, and the procedures outlined in the Forestry Handbook to implement the Habitat Conservation Plan conservation strategies, influence the quality and distribution of wildlife habitat on the state trust lands.

Two Forest Resource Plan policies specifically govern management of wildlife on forested trust lands:

- Forest Resource Plan Policy No. 22 directs DNR to provide wildlife habitat conditions that have the capacity to sustain native wildlife populations or communities. Where wildlife habitat management objectives appear to conflict with trust management obligations, DNR is to seek balanced solutions.
- Forest Resource Plan Policy No. 23 makes explicit DNR's commitment to meeting the requirements of federal and state laws and other legal requirements that protect endangered, threatened, and sensitive species of wildlife and plants and their habitats (see Section C.1 [Threatened, Endangered, and Sensitive Plants] for a summary of the Endangered Species Act as it applies to DNR actions). The policy further directs DNR to participate in efforts to recover and restore these species, to the extent that such participation is consistent with trust obligations.

The Habitat Conservation Plan is a plan for state trust lands that allows timber harvesting and other management activities to continue while providing for species conservation as described in the Endangered Species Act. To this end, the Habitat Conservation Plan identifies conservation goals and strategies for the conservation of spotted owls, marbled murrelets, other federally listed species, and certain unlisted species of concern, as well as habitat for riparian-associate species. The intended aggregate effect of these conservation strategies is the creation of landscapes containing interconnected patches of late-successional forest, along with early and mid-seral stage forest habitat in other managed forestlands.

More than 20 DNR procedures have been developed to implement the Forest Resource Plan policies and Habitat Conservation Plan conservation strategies designed to manage wildlife and their habitat on westside trust lands. Procedures that apply to species and habitats addressed in this Environmental Impact Statement are identified in the appropriate discussions below. Only one procedure specific to wildlife (Procedure 14-004-120, Management Activities Within Spotted Owl Nest Patches, Circles, Designated Nesting, Roosting, and Foraging and Dispersal Management Areas) is under consideration for revision under the proposed Alternatives. Current implementation of this procedure is described in the discussion of spotted owls below.

Procedures for management of forest, riparian areas, and wetlands influence wildlife habitat conditions. See Section 4.2 (Forest Structure and Vegetation) for a discussion of the policies, procedures, and tasks that relate to the management of forest structure classes, old forest, and legacy trees, as well as forest management within riparian and wetland

zones. Sections C.2 (Riparian Areas) and C.7 (Wetlands) provide additional information about the management direction for these habitat types.

C.3.1 Uncommon and Non-forested Habitats

The following DNR procedures address unique and uncommon habitats. None of these is under consideration for revision under any of the alternatives addressed in this Environmental Impact Statement.

- 14-004-170 Protecting Talus Fields
- 14-004-180 Protecting Caves
- 14-004-190 Protecting Cliffs
- 14-004-200 Protecting Oak Woodlands
- 14-004-220 Protecting Balds (i.e., grass- or moss-dominated forest openings)
- 14-004-230 Protecting Mineral Springs

C.3.2 Northern Spotted Owl

Northern spotted owl habitat requirements are addressed in DNR's Habitat Conservation Plan through the provision of habitat in nesting, roosting, and foraging management areas and in dispersal management areas. In implementing the spotted owl conservation strategy, DNR Procedure 14-004-120 specifies the following minimum requirements for nesting, roosting, and foraging habitat:

- at least 50 percent of the total basal area in conifer trees greater than 3.5 inches diameter at breast height;
- a relative density of at least 50;
- no more than 280 trees per acre;
- at least 40 trees per acre that are at least 85 feet tall;
- at least 3 snags or cavity trees per acre that are at least 20 inches diameter at breast height and at least 16 feet tall; and
- 2,400 cubic feet per acre of down woody debris.

DNR Procedure 14-004-120 directs the implementation of the Habitat Conservation Plan's conservation strategy for northern spotted owls. The procedure addresses three aspects of the conservation strategy as follows:

1. *Spotted owl nest patches*: No management activities are permitted.
2. *Spotted owl circles*: Prior to 2007, no timber harvest is allowed within certain spotted owl circles, and harvest is allowed only within non-habitat areas of several other circles. In addition to these circles (collectively referred to as "Memorandum 1" owl circles), two other groups of circles also receive explicit consideration. Timber harvest activities are allowed only in the non-habitat portions of four northern spotted owl circles in southwestern Washington, and only habitat enhancement activities are allowed in the non-habitat portion of all Status 1-Reproductive owl circles throughout DNR westside trust lands.

3. *Management activities within designated nesting, roosting, and foraging and dispersal management areas*: In watersheds where the amount of nesting, roosting, and foraging or dispersal habitat is below the 50 percent threshold, no timber harvest is allowed in areas that currently provide habitat, and only habitat enhancement activities are allowed within non-habitat portions.

DNR Procedure 14-004-120 differs from the Habitat Conservation Plan with respect to the third item above. The Habitat Conservation Plan permits timber harvest in nesting, roosting, and foraging management areas in watersheds that consist of less than 50 percent of this habitat, provided the stand still meets the definition of nesting, roosting, and foraging habitat after thinning. In addition, regeneration harvest is allowed in stands that do not count towards the required amount of nesting, roosting, and foraging habitat in a watershed.

The Habitat Conservation Plan does not designate any specific areas in the Olympic Experimental State Forest for management of spotted owl habitat. Instead, DNR has divided the Olympic Experimental State Forest into 11 landscape planning units, each made up of one or more watersheds. Within each landscape planning unit, DNR is maintaining or restoring threshold proportions of potential habitat. These proportions are (1) at least 20 percent of DNR-managed lands in the understory reinitiation to old natural forest stages, and (2) at least 40 percent of DNR-managed lands in the stem exclusion to old natural forest stages. As noted above, the forest structure classes used for analyses in this document are not the same as those by which DNR is monitoring the progress of its Habitat Conservation Plan conservation strategies. Forest structure classes serve as an analogous measure, and may provide an index for the relative changes in the amounts of these habitats over time. For this analysis, therefore, structurally complex forest can be considered a surrogate for the first (20 percent) threshold, and competitive exclusion plus structurally complex forest can be considered a surrogate for the second (40 percent) threshold.

C.3.3 Marbled Murrelet

Reflecting the lack of certainty about the specific habitat needs of marbled murrelets, the Habitat Conservation Plan defined an interim conservation strategy for this species. The interim strategy for marbled murrelets involves a habitat relationship study designed to identify marginal habitats that are expected to support murrelets. These lands (with the exception of any known occupied sites contained therein) are then managed for timber harvest. All remaining suitable habitat is surveyed for marbled murrelets, and unoccupied habitat is released for harvest on three conditions: (1) it is not in southwestern Washington; (2) it is more than 0.5 mile from a known occupied site; and (3) at least 50 percent of the suitable habitat on DNR-managed lands in the watershed will remain following harvest.

Habitat relationship studies have been conducted in the Olympic Experimental State Forest, South Coast, Columbia, Straits, and North Puget Sound Planning Units. Habitat relationships studies have not been conducted in South Puget Sound Planning Unit: neither higher quality ("reclassified") habitat (95 percent of occupied sites) nor marginal habitat (5 percent of occupied sites) has been identified. South Puget Sound is still operating

under Step 1 of the interim conservation strategy, which entails identifying and deferring timber harvest of suitable habitat blocks (defined on p. IV.41 of the Habitat Conservation Plan).

Inventory surveys have been completed in South Coast, Columbia, and Straits planning units. About 80 percent of inventory surveys have been completed in the Olympic Experimental State Forest. Roughly 25 percent of inventory surveys have been completed in North Puget Sound. No inventory surveys have been completed in South Puget Sound. Surveyed, unoccupied reclassified habitat has been released, with the above three restrictions, in the portions of the Straits and South Coast Planning Units that are not situated in southwestern Washington. Reclassified habitat would not likely be released in the Olympic Experimental State Forest, Columbia, or North Puget Sound Planning Units until the long-term strategies are in place. Long-term strategy planning is moving forward for Olympic Experimental State Forest, Straits, South Coast, and Columbia Planning Units.

Suitable nesting habitat for marbled murrelets generally occurs in forested areas within 50 miles of marine waters, and is characterized by a multi-layered canopy and large, high branches that serve as nesting platforms (USFWS 1997). Most nest stands are dominated by low-elevation conifers such as Douglas-fir, western red cedar, Sitka spruce, and western hemlock (USFWS 1997). "Reclassified" habitat, which is based on predictive models built from the habitat relationship studies mentioned above, occurs in areas with the greatest potential to support nesting marbled murrelets. Unless surveyed and found unoccupied, such areas are considered "off-base," that is, not available for timber harvest. Because murrelet habitat relationship studies have not been completed in all six westside Habitat Conservation planning units, analyses in this Environmental Impact Statement take a more general approach, using structurally complex forest as a substitute for suitable nesting habitat for marbled murrelets.

C.3.4 Other Threatened, Endangered, and Sensitive Wildlife Species

Appendix Table D-7 lists the Threatened, Endangered, and Sensitive species that are known or suspected to occur on DNR-managed westside trust lands. It includes the species' state and federal listing status, and the habitats with which they are associated.

DNR procedures provide specific direction for the management of habitat for species of interest, including Threatened, Endangered, and Sensitive species.

- 14-004-240 Protecting Common Loon Nests
- 14-004-250 Protecting Harlequin Duck Nests
- 14-004-260 Protecting Northern Goshawk Nests West of the Cascades
- 14-004-270 Protecting California Wolverine Dens
- 14-004-280 Protecting Pacific Fisher Dens
- 14-004-300 Protecting Vaux's Swift Nests and Night Roosts
- 14-004-310 Protecting Myotis Bat Communal Roosts and Maternal Colonies
- 14-004-320 Protecting Marbled Murrelet Habitat
- 14-004-330 Protecting Bald Eagle Nesting, Roosting, and Foraging Sites

- 14-004-340 Protecting Peregrine Falcon Habitat
- 14-004-350 Protecting Gray Wolf Habitat
- 14-004-360 Protecting Grizzly Bear Habitat
- 14-004-370 Protecting Oregon Silverspot Butterfly Habitat
- 14-004-380 Protecting Columbia White-tailed Deer Habitat
- 14-004-390 Protecting Aleutian Canada Goose Habitat

C.4. GEOMORPHOLOGY, SOILS, AND SEDIMENT

C.4.1 Current Policies and Procedures

C.4.1.1 Mass Wasting

There are no explicit policies for describing appropriate types of management activities on potentially unstable areas in the Forest Resource Plan. However, several policies such as Policy No. 16 (Landscape Planning), Policy No. 19 (Watershed Analysis), Policy No. 20 (Riparian Management Zones), Policy No. 30 (Silviculture Activities), and Policy No. 31 (Harvest and Reforestation Methods) describe objectives for the protection of soils, water quality, fish, wildlife, and other non-timber resources. In addition, Procedure 14-004-050 (Assessing Slope Stability) has the stated objective of protecting water quality, riparian ecosystem functions, and minimizing adverse impacts to salmonid habitat by restricting management activities on unstable slopes. These measures include the identification and avoidance of unstable slopes that would increase the frequency or severity of deep-seated or shallow-rapid landslides. Under this procedure, management activities other than required roads are prohibited on areas of instability or potential instability.

Under the Habitat Conservation Plan, conservation measures for the protection of unstable slopes are covered under the Riparian Conservation Strategy (DNR 1997, page II.62). Finally, if harvest is proposed in a potentially unstable area, a review of proposed forest practices and mitigations on potentially unstable slopes for effects on water quality and public safety are required under Washington Administrative Code 222-10-030 and Washington Administrative Code 222-16-050 1(d) in compliance with the State Environmental Policy Act Guidelines.

C.4.1.2 Surface Erosion

Sediment input to streams is minimized during harvest felling and yarding by existing Forest Practices Rules, Washington Administrative Code 222-30 (Timber Harvesting). These rules prescribe the practices and limits for acceptable felling and yarding techniques, especially near streams.

C.4.1.3 Soil Productivity

Forest Resource Plan policies for the management of soil productivity include Policy No. 30 (Silviculture Activities), Policy No. 31 (Harvest and Reforestation Methods), Policy No. 34 (Fertilizing, Thinning, and Pruning), Policy No. 11 (Managing On-Base Lands), and Policy No. 9 (Forest Health). Each of these policies includes protection or enhancement of soils and/or biological productivity for growing trees. The Habitat Conservation Plan does not include conservation measures for protecting soil productivity other than through the

retention of soils by minimizing and avoiding soil erosion and landslides. DNR Procedure 14-005-020 (Identifying and Prioritizing Stands for Regeneration Harvest) provides criteria for determining when a stand is ready for a regeneration harvest, which could affect soil productivity.

DNR Procedure 14-005-020 describes a method to determine the minimum age at which stands may be harvested. This procedure defines "rotation age" as the planned number of years between regeneration harvests and is a result of the previous sustainable harvest process. This is the average minimum age at which a stand may be considered for regeneration harvest if the stand is not in an area with an acreage constraint, such as a nesting, roosting and foraging and dispersal area. The average minimum regeneration harvest age varies by site class and species, but for areas on the west side of the Cascade crest without identified area-based landscape level conservation strategies, rotation ages are anticipated to average 60 years.

C.4.1.4 Harvest and Reforestation Methods

The methods used to harvest trees can affect soil health and productivity. Ground-based systems and cable systems without full suspension have the greatest relative potential to increase compaction or surface erosion, which can decrease soil productivity for some soils. Policy No. 31 (Harvest and Reforestation Methods) in the Forest Resource Plan states that DNR intends to examine every proposed harvest unit to select the harvest method that best satisfies the following criteria:

- Meets DNR responsibilities for generating current and long-term income
- Meets biological constraints of the site condition
- Maintains future stand productivity and health
- Accomplishes DNR's objectives for protecting water quality and quantity and fish and wildlife habitat
- Minimizes impacts on special ecological features and wetlands
- Additionally, DNR Procedure 14-006-070 prescribes specifications for skidding and yarding to avoid or minimize soil compaction. Soil restrictions have been developed to minimize the potential for soil compaction or other disturbance to sensitive soils during timber harvest and road building activities. For example, restrictions limit skid trail widths and restrict ground-based logging to periods when soils are dry.

Intensity of Management/Fertilizer Use

Forest fertilization can improve financial yields and may improve forest health for some sites. Fertilization includes both aerial and ground applications. Other practices such as site preparation, and vegetation management are important management tools to either protect or increase financial yields. Site preparation includes a variety of techniques that includes aerial and ground herbicide applications, broadcast burns, ground mechanical treatments, and pile and burn. Vegetation management includes aerial and ground herbicide applications, and mechanical and hand vegetative control methods. The policy preference established in Forest Resource Plan Policy No. 33 determines operational application of these practices.

Forest Resource Plan Policy No. 34 (Fertilizing, Thinning, and Pruning) states that the Department is encouraged to conduct fertilization, thinning, and pruning activities only on sites that will produce an acceptable rate of return, such that the benefits must exceed the cost of any of these activities. Maintaining water quality is also cited as a concern related to fertilizer use.

Site Preparation

Forest Resource Plan Policy No. 30 (Silviculture Activities) states that the Department intends to minimize the need for all forms of site preparation (including burning, herbicide use, hand slashing, and tractor or mechanical clearing) by careful analysis and planning and selection of reforestation methods. The policy also states that the Department intends to select the most appropriate methods if necessary. Choice of a specific site preparation method would depend on quantity and type of residue and vegetation, topography, species selected for the site, soil characteristics, water, costs, laws, regulations, and local concerns.

C.4.1.5 Vegetation Management

Forest Resource Plan Policy No. 33 (Control of Competing Vegetation) ranks the potential methods used to control competing vegetation in order of preference:

1. No treatment
2. Non-herbicide (hand cutting)
3. Ground-applied herbicide
4. Aerial-applied herbicide

The use of any treatment method must balance the return on investment with the potentially adverse effects on public water supplies, public health, fish health, fish and wildlife habitat, or the effects on other trees, herbs and shrubs, erosion, or applicator safety.

C.4.2 Proposed Changes in Policies and Procedures

C.4.2.1 Mass Wasting

None of the proposed alternatives would modify Procedure 14-004-050 (Assessing Slope Stability) or current Forest Practices Rules for potentially unstable slopes. As defined under Forest Practices Rules, Washington Administrative Code 222-16-050 1(d) for Class IV special harvest, these areas would continue to be either thoroughly evaluated for potential impacts and mitigation before harvest activities begin, or avoided, depending on the level of resources available.

C.4.2.2 Surface Erosion

Policies and procedures concerning harvest practices that would affect surface erosion would not be modified under any of the alternatives. Changes to Procedure 14-005-020 (Identifying and Prioritizing Stands for Regeneration Harvest) under Alternatives 2 through 6 could adversely affect the risk of surface erosion under these alternatives by allowing for more intensive management of stands. Resources dedicated to planning of harvest activities to prevent or mitigate surface erosion may need to be increased under these alternatives as a result.

C.4.2.3 Soil Productivity

Changes are anticipated to Procedure 14-006-070 (Westside Smallwood Thinning Procedures), but direction on minimization of soil compaction would remain the same, causing no net loss of soil productivity as a result. Changes would occur in Procedure 14-005-020 (Identifying and Prioritizing Stands for Regeneration Harvest) under Alternatives 2 through 6. These alternatives propose more intensive use of variable density thinning, fertilizer, and tree planting. Under Alternatives 1, 2, and 3, the average minimum age for regeneration harvests would be 60 years, while under Alternatives 4, 5, and 6 the average minimum rotation age would be 80 years, 50 years, and variable, respectively.

C.5. HYDROLOGY

C.5.1 Policies and Procedures

Policy No. 19 (Watershed Analysis) of the Forest Resource Plan addresses the potential risk of adverse effects from water quantity changes through the watershed risk assessment. Other policies such as Policy No. 16 (Landscape Planning), Policy No. 20 (Riparian Management Zones), Policy No. 30 (Silviculture Activities), and Policy No. 31 (Harvest and Reforestation Methods) also provide policy direction by describing objectives for the protection of water quality, fish, and other non-timber resources.

Under the Habitat Conservation Plan, conservation measures for avoiding changes to peak flows are covered under the riparian conservation strategy (DNR 1997, p. IV.68). Procedure 14-004-060, Assessing Hydrologic Maturity, defines the methodology to be used in basins where watershed analysis has not been conducted. With some exceptions, the basic protective measure is to maintain at least two-thirds of the westside trust forest lands in the rain-on-snow and snow-dominated zones in hydrologically mature condition for sub-basins greater than 1,000 acres. A hydrologically mature stand is defined as a well-stocked conifer stand over the age of 25 years with a relative density of at least 25.

None of the alternatives would modify DNR Procedure 14-004-060. Harvest is not allowed in at least two-thirds of the westside trust forest lands in the rain-on-snow and snow- dominated zones in hydrologically mature condition in each sub-basin greater than 1,000 acres. Because overall harvest levels would increase in all alternatives except 1 and 4 (particularly in upland and riparian areas under Alternatives 5 and 6), the amount of harvest in rain-on-snow zones would also likely increase in those alternatives. Because these alternatives do not propose changing DNR Procedure 14-004-060, at least two-thirds of the rain-on-snow and snow zones would be maintained in hydrologically mature forest in all sub-basins greater than 1,000 acres. Some harvests may be delayed to provide sufficient time for more forest to become hydrologically mature. As part of the DNR landscape planning and harvest scheduling activities, DNR would inspect rain-on-snow and snow dominated areas prior to planning harvests to ensure that Procedure 14-004-060 would be met under all alternatives.

C.5.2 Stream Typing

Streams in forested westside trust lands are classified according to the following system. (For the complete classification system, refer to Washington Administrative Code 222-16-030.)

- **Type 1**: All waters, within their ordinary high-water mark, inventoried as shorelines of the state.
- **Type 2**: Segments of natural waters that are not Type 1 and have a high use and are important from a water quality standpoint for domestic water supplies; public recreation; fish spawning, rearing, or migration or wildlife uses; or are highly significant to protect water quality.
- **Type 3**: Segments of natural waters that are not Type 1 or 2 and are moderately important for the uses listed under Type 2.
- **Type 4**: Segments of natural waters that are not Type 1, 2, or 3, and for the purpose of protecting water quality downstream are classified as Type 4 water upstream until the channel width becomes less than 2 feet in width between the ordinary high-water marks. These may be perennial or intermittent.
- **Type 5**: Natural waters that are not Type 1, 2, 3, or 4; including streams with or without well-defined channels, areas of perennial or intermittent seepage, ponds, natural sinks, and drainage ways having short periods of spring or storm runoff.
- **Type 9**: Streams of unknown classification.

C.6. WATER QUALITY

C.6.1 Current Policies and Procedures

The Washington State Forest Practices Rules comply with the federal Clean Water Act to meet state water quality standards for surface waters and groundwater (Table C.6-1). Water quality standards are set to provide for the protection of designated uses, including public water supply, wildlife habitat and salmon spawning, rearing and migration.

Section 303(d) of the federal Clean Water Act requires the state of Washington periodically to prepare a list of all surface waters in the state for which beneficial uses of the water are impaired by pollutants. As of 1998, about 2 percent of all the waters in Washington were identified as impaired. Segments of almost 250 streams were listed in western Washington in 1998 (see Appendix D, Section D.5). It is possible that other unmeasured water bodies also exceed water quality standards. The primary water quality problem on forestlands throughout the state is temperature. Elevated water temperature generally occurs as a result of timber harvest that removes vegetation that provides shade to water bodies (Forest Practices Rules Environmental Impact Statement [Washington Forest Practices Board 2001]). The Washington Department of Ecology adopted updated water quality standards in June 2003 (Department of Ecology 2003). The updated standards must be approved by the federal Environmental Protection Agency, National Oceanic and Atmospheric Administration – Fisheries Service, and the U.S. Fish and Wildlife Service before they take effect. Included in the updated standards is a change in temperature requirements to protect critical life stages (incubation, spawning, and rearing) of salmon and bull trout. The Department of Ecology is now preparing a draft 303(d) list, which is expected to be ready for public comment in the summer of 2003.

Table C.6-1. Washington State Water Quality Standards for the Major Non-Chemical Parameters of Concern[1/]

Water Quality Parameter	Washington State Standard (Class AA, Excellent)	Washington State Standard (Class A, Good)
Temperature	Shall not exceed 16.0°C due to human activities. When natural conditions exceed 16°C, no temperature increase greater than 0.3°C is allowed. Incremental temperature changes from nonpoint source activities shall not exceed 2.8°C.	Shall not exceed 18.0°C due to human activities. When natural conditions exceed 18°C, no temperature increase greater than 0.3°C is allowed. Incremental temperature changes from nonpoint source activities shall not exceed 2.8°C.
Sediment	In regard to forest practices, implementation of approved best management practices will meet narrative water quality criteria such as support characteristic water uses, aesthetic values, etc.	Same as AA.
Turbidity[2/]	Shall not exceed 5 NTU (nephelometric turbidity units) over background when the background level is 50 NTUs or less, nor increase more than 10% of background when the background level is 50 NTUs or more.	Same as AA.

1/ New water quality standards have been proposed and are currently in a draft status. The new standards for temperature would be lower and more specific to fish populations (Department of Ecology 2003).

2/ Nephelometric turbidity units are the measurement units of turbidity using a nephelometer (light reflected surfaces of particles in suspension that are at right angles to the light source). 0 NTUs is clear and free of particles. >999 NTUs is essentially opaque.

NTU = nephelometric turbidity unit

Source: Forest Practices Rules Environmental Impact Statement (Washington Forest Practices Board 2001)

Additional policies exist to protect water quality. Policy No. 19 (Watershed Analysis) of the Forest Resource Plan addresses water quality through a risk assessment process, as directed by Policy No. 19, of DNR harvest and silvicultural activities on water quality. Watershed analysis is conducted in conjunction with landscape planning (Policy No. 16).

Several other policies such as Policy No. 20 (Riparian Management Zones), Policy No. 30 (Silviculture Activities), and Policy No. 31 (Harvest and Reforestation Methods) also describe objectives for the protection of soils, water quality, fish, wildlife, and other non-timber resources. Policy No. 34 (Fertilization, Thinning and Pruning) is also indirectly related by considering water quality objectives when using fertilization. Under the Habitat Conservation Plan, conservation measures for the protection of water are covered under the Riparian Conservation Strategy of the Habitat Conservation Plan (DNR 1997, p. IV.55). DNR Procedures relevant to protection of water quality include:

- Procedure 14-004-050 – Assessing Slope Stability;
- Procedure 14-006-040 – Controlling Competing Vegetation;
- Procedure 14-004-110 – Wetland Management;

- Procedure 14-004-230 – Protecting Mineral Springs; and
- Procedures 14-004-150 and 14-004-160 – Identifying and Protecting Riparian and Wetland Management Zones.

C.7. WETLANDS

For federal regulatory purposes, wetlands are considered a subclass of Special Aquatic Sites (40 Code of Federal Regulations Section 230.3) and have been deemed Waters of the United States (33 Code of Federal Regulations 328.3). All Waters of the United States are subject to regulation through the federal Clean Water Act by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. Sections 404 and 401 of the Clean Water Act were created specifically with the intent "to restore and maintain the chemical, physical, and biological integrity of our Nation's waters." Exemptions granted under Section 404(f)(1) permit are normally for agricultural, ranching, and silvicultural activities, as well as maintenance of existing drains, farm ponds, and roads.

On DNR forested trust lands, the forest management activities are regulated by the Washington Forest Practices Rules, DNR Forest Resource Plan, or Habitat Conservation Plan, whichever is more restrictive. The regulations, policies, and procedures of each document guiding forest management activities on DNR westside trust lands are described below.

C.7.1 Washington State Forest Practices Rules

The Washington State Forest Practices Rules recognize two primary types of wetlands: forested and non-forested. Forested wetland means any wetland or portion thereof that has, or if the trees were mature would have, a crown closure of 30 percent or more. Non-forested wetland means those wetlands that do not, or would not if the trees were mature, have crown closures of 30 percent or more.

All forested and non-forested wetlands and forested and non-forested bogs over 0.25 acres in size require designation of a Wetland Management Zone. Forested wetlands are not designated with Wetland Management Zones. The Wetland Management Zones are defined as specified areas where specific measures are taken to protect the wetland functions. The size of the Wetland Management Zone is determined by the Forest Practices classification of the individual wetland and partial cutting or removal of group trees is allowed in Wetland Management Zones by the Forest Practices Rules. The Forest Practices Rules do not provide protection to wetlands under 0.25 acre in size.

The Washington State Forest Practices Board Manual describes two approaches for identifying and delineating wetlands: approximate determination and accurate delineation. Approximate determination of wetland boundaries uses maps, aerial photographs, other information, and field visits if necessary. It can be used to identify forested wetlands greater than three acres, classifying the type of wetland that is within or adjacent to the proposal and determination of acres of non-forested wetlands, and determination of forested wetlands associated with a Riparian Management Zone. An accurate delineation of wetland boundaries is required to determine those portions of any wetland where road construction could result in filling or draining more than 0.1 acre.

C.7.2 DNR Forest Resource Plan

DNR management activities in and around wetlands on all forested trust lands follow DNR Forest Resource Plan Policy No. 21, which states "the Department will allow no overall net loss of naturally occurring wetland acreage and function." The policy recognizes that some loss of function may occur in the course of its forest management activities. The policy emphasizes avoiding the loss of wetlands and allows for mitigation if it occurs. If mitigation is necessary, preference would be given to on-site and in-kind replacement of acreage and function.

DNR Procedures 14-004-110 and 150 provide wetland management guidance for implementation of the Forest Resource Plan and the Habitat Conservation Plan. These procedures define the wetland buffers and provide a basis for evaluating management activities. Under these procedures, all wetlands over 0.25 acres in size, forested and non-forested, are provided with buffers. Wetland buffers are defined as follows:

Olympic Experimental State Forest

- Wetlands 0.25 to 5 acres: two-thirds of the site potential tree height
- Wetlands larger than 5 acres: 1 site potential tree height

Other Westside Planning Units

- Wetlands 0.25 to 1 acre: 100 feet
- Wetlands greater than 1 acre: The larger of 100 feet or greater than or equal to 1 site potential tree height

DNR Procedure 14-004-110 describes forestry management activities allowed in westside forested wetlands and their associated forested buffers and also in forested and non-forested wetlands in Olympic Experimental State Forest. Procedure 14-004-150 specifies the type of forestry activities allowed in Wetland Management Zones (non-forested wetlands and their buffers) in the westside planning units (not including the Olympic Experimental State Forest). The procedures for harvest in forested wetlands and their associated buffers are:

Olympic Experimental State Forest

- Maintain and perpetuate a stand that is windfirm and has a minimum basal area of 120 square feet per acre.

Other Westside Planning Units

- Maintain and perpetuate a stand that is windfirm and has a minimum basal area of 120 square feet per acre.
- Provide on-site and in-kind mitigation for road construction requiring mitigation
- Limit disturbance in the area. Remediation of necessary disturbance should: 1) restore and maintain a condition that is as close to natural drainage as possible; and 2) restore water storage. Limit disturbance by imposing seasonal restrictions, conducting direct felling activities to avoid ground equipment entry, carefully planning yarding corridors and skid trails, using low pressure tire equipment or cable systems, and restoring natural drainage.

C.7.3 Habitat Conservation Plan

The DNR Habitat Conservation Plan defines the objective of the wetland protection strategy as maintaining hydrologic function through:

1. Continuously maintaining a plant canopy that provides a sufficient transpiration surface and established rooting,
2. Maintaining natural water flow, and
3. Ensuring stand regeneration.

Under the Habitat Conservation Plan, as under the Forest Resource Plan, all forested and non-forested wetlands over 0.25 acres are buffered. The buffers are the same as described above for Procedures 14-004-110 and 14-004-150.

The Habitat Conservation Plan also requires on-site and in-kind equal acreage mitigation for road building in wetlands. In the Habitat Conservation Plan, direction for forest management in forested wetlands is to minimize entry and use practices that minimize disturbance. The Habitat Conservation Plan specifies that if ground disturbance alters the natural surface or subsurface drainage of a wetland, restoration is required; soil compaction and rutting usually preclude the use of ground-based equipment in wetlands; and salvage operations are permitted in buffers that are not periodically flooded.

Wetlands within Riparian Management Zones are also regulated by regulations, policies, and procedures that apply to Riparian Management Zones (discussed in Section C.2, Riparian Areas). Because of the restrictions described above, this does not impose additional regulations on non-forested wetlands. However, forested wetlands within a Riparian Management Zone receive incidental protection because the Riparian Management Zone requirements are more restrictive.

C.8. FISH AND FISH HABITAT

The Forest Resource Plan (DNR 1992) includes policies for protecting aquatic systems, including fish and fish habitat. These policies are:

- Policy No. 19 – Watershed Analysis;
- Policy No. 20 – Riparian Management Zones; and
- Policy No. 21 – Wetlands.

Watershed analysis directs DNR to analyze the risk to public resources (such as water, air, fish, wildlife, and soil) and trust interests from major activities in a watershed. The analysis considers both state forestland and adjacent properties that could impact management of trust assets. The process directed under Policy No. 19 does not require the use of the Watershed Analysis Methodology developed by the Washington Forest Practices Board. Watershed analysis using the Watershed Analysis Methodology has been implemented by private forestland owners in some watersheds and by DNR for some state trust lands (e.g., the Loomis State Forest in eastern Washington). The Forest Practices Rules Environmental Impact Statement (Washington Forest Practices Board 2001) indicated that approximately 10 percent of private and state forest lands of Washington

(state-wide) had watershed analysis completed using the Watershed Analysis Methodology and about 10 analyses were expected to be completed annually.

Policy No. 20 requires that Riparian Management Zones be established along Types 1 through 4 streams and along Type 5 streams when necessary. Within the Riparian Management Zones, DNR is required to focus on protecting key non-timber resources, such as water quality, fish, wildlife habitat, and sensitive plant species.

Policy No. 21 requires that DNR allow no overall net loss of naturally occurring wetland acreage and function. As indicated above, wetlands are an important component to water quantity and water quality within a watershed. Consequently, wetlands are indirectly important to the maintenance of fish populations and fish habitat.

In addition to policies specific to aquatic resources, Policy No. 23, Endangered Species, requires DNR to meet the requirements of federal and state laws and other legal requirements that protect threatened, endangered, and sensitive species and to support efforts to recover and restore species listed under the federal Endangered Species Act to the extent that such participation is consistent with trust obligations.

One of the ways that DNR addresses Policy No. 23 is through their Habitat Conservation Plan. At the time the Habitat Conservation Plan was prepared, none of the salmon and trout species mentioned in Section 4.10 of this EIS was listed in western Washington, but all were included as covered species. The Habitat Conservation Plan strategy for protecting covered fish species was termed the Riparian Conservation Strategy and had the objectives of (1) maintaining or restoring salmonid freshwater habitat on DNR-managed lands, and (2) contributing to the conservation of other aquatic and riparian-obligate species (DNR 1997, p. IV.55). Components to the Riparian Conservation Strategy include activity restrictions in Riparian Management Zones, protection of unstable hillslopes and mass-wasting areas, a road management strategy, requirements for hydrologic maturity in the rain-on-snow zone, and wetlands protection. Procedures designed to implement the Forest Resource Plan policies and the Riparian Conservation Strategy include the following:

- Procedure 14-004-050 – Assessing Slope Stability (see Section C.4, Geomorphology, Soils, and Sediment);
- Procedure 14-004-060 – Assessing Hydrologic Maturity (see Section C.5, Hydrology);
- Procedure 14-004-110 – Wetland Management (see Section C.7 Wetlands); and
- Procedures 14-004-150 and 14-004-160 – Identifying and Protecting Riparian and Wetland Management Zones (see Section C.2, Riparian Areas).

C.9. CULTURAL RESOURCES

The importance of protecting cultural resources on lands owned and under the jurisdiction of the state of Washington has been codified in law and policy, including Revised Code of Washington 27.44 and 27.53, Policy No. 24 of the Forest Resource Plan, and the Habitat Conservation Plan.

- **Revised Code of Washington 27-44 – Indian Graves and Records Act.** This statute makes it a crime to knowingly disturb, remove, or damage American Indian graves and glyptic records, such as petroglyphs or pictographs.
- **Revised Code of Washington 27-53 – Archaeological Sites and Resources Act.** This statute prohibits any individual, corporation, or agency from knowingly removing, altering, or disturbing any archaeological site or object without a written permit from the Director of Community, Trade, and Economic Development, or designee.
- **DNR Forest Resource Plan – Policy No. 24.** Titled "Identifying Historic Sites," this policy declares that DNR will establish a program to identify and inventory historic and archaeological sites, and protect them at a level that, at a minimum, meets regulatory requirements. DNR will follow procedures equivalent to those required under Section 106 of the National Historic Preservation Act, which requires a consideration of the effects of a federal undertaking on properties eligible for or listed on the National Register of Historic Places.
- **DNR Habitat Conservation Plan – Cultural Resource Protections.** The Habitat Conservation Plan falls back on the above referenced statutes to ensure that archaeological sites and Indian graves are protected from disturbance. It identifies DNR's Total Resource Application Cross-Reference system as an important tool for ensuring that department activities do not damage such sites. The cultural resource portion of this system is based on the cultural resource database maintained by the Office of Archaeology and Historic Preservation.

C.10. SCENIC RESOURCES

DNR manages approximately 1.4 million acres of forested westside trust lands. These lands span vegetation zones from near sea level to mountaintops, and include a wide range of landscape types and scenic resources characteristic of western Washington, including coastal and high elevation forests, alpine lakes, and rocky shorelines. High quality scenery, especially scenery with natural-appearing landscapes, is generally regarded as an important resource that enhances peoples' quality of life and influences the quality of recreation experiences and, in some cases, adjacent property values.

The primary guiding principles for the management of the forest resource on DNR forested trust lands are contained in Forest Resource Plan policies and DNR Forestry Handbook Procedures. The Visual Management procedure outlined in DNR Procedure 14-004-080) is used to identify timber production areas that should be managed for visual concerns. Although DNR primarily manages trust lands to produce income for the various trusts and maintain a healthy ecosystem, visual concerns are also considered. Visual concerns do not, however, apply to all areas. In cases where visual concerns do apply, management decisions seek a balanced solution between visual impact, income, and ecosystem objectives.

Areas where potential visual concerns exist include major highway corridors, cities and towns, adjacent housing developments, and trails and other recreation areas. DNR's Visual Management Procedure 14-004-080 outlines the procedure whereby DNR regions locate areas that may be managed to reduce the visual impact of harvest and road building

activities. This involves considering the viewsheds of major highways, urban areas, and recreation areas, and identifying where DNR-managed lands are located within those viewsheds. The locations of proposed harvest areas are considered in terms of distance zone (immediate view, foreground, middleground, or background) and their size is compared to the overall size of the affected viewshed. Other factors considered include adjacent land uses, the level of neighbor involvement, and the duration of the view.

In addition to westside forested trust lands that are managed for the support of trust beneficiaries, DNR also manages some westside lands as Natural Area Preserves (14,200 acres) and Natural Resource Conservation Areas (59,800 acres). These lands are managed to preserve the best remaining examples of many ecological communities and protect outstanding native ecosystems, habitat for endangered, threatened, and sensitive plants and animals, and scenic landscapes, respectively. These lands, which are "off-base" for harvest, help support management objectives by managing and conserving habitat for habitat conservation species, where appropriate.

Appendix C

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